

only four species have been included *Platyptilia ochrodactyla* (*bertrami*) *Stenoptilia* (*Mimaeseoptilus*) *bipunctidactyla*, *S. (M.) pterodactyla* and *Oidaematophorus* (*Pterophorus*) *monodactylus*, of which he has sent me both the grey and brown forms.

This shows what can be done by systematically collecting even in a garden—provided that garden is in such a favourable locality as the Essex marshes.

### Some New Australian Ants.

By W. C. CRAWLEY, B.A., F.E.S.

The following paper contains descriptions of new species of *Ponerinae*, *Myrmicinae*, *Dolichoderinae*, and *Camponotinae*, captured by Prof. E. B. Poulton, Mr. G. F. Hill, and others in 1914-16. Those taken by Professor Poulton include the true female of *Euponera lutea*, Mayr, entirely different from the ant described as such by Mayr, who qualifies his determination by the words "*probabiliter ad hanc speciem pertinens*." Either Mayr's ♀ (an ant continually occurring in collections without accompanying ♂s), should be referred to another species, or the new ♀ (taken with the ♂s in the nest) must be considered as a B form.

#### Sub-fam.: PONERINÆ.

*Euponera* (*Brachyponera*) *lutea*, Mayr. ♀.  
(Hitherto undescribed.)

L. 7mm.

Rather lighter castaneous brown than the ♂, which it very much resembles; the upper surface of thorax darker than the rest of the body. (Mayr's ♀ is almost entirely black.)

Mandibles triangular, proportionately longer than in the ♂, terminated by a large tooth, which is preceded by two smaller blunt teeth; the rest of the terminal border irregular, but not properly dentate.

Head as broad as long, narrowing somewhat behind, where the occipital border is nearly straight; clypeus flatter than in the ♂, with a shallow longitudinal groove, the anterior border feebly convex; frontal carinae as in the ♂; eyes large (larger in proportion than in Mayr's ♀), placed close to the anterior border of head; ocelli large (also larger than in Mayr's ♀).

Thorax longer and narrower proportionately than in Mayr's ♀, narrowing very slightly behind the wings; anterior border of pronotum less convex, and angles more shouldered; scutum of mesonotum longer than broad; there is hardly any angle between the two surfaces of epinotum, and the fall of the declivity is much less abrupt than in Mayr's ♀. Scale seen from above, twice as broad as long, convex in front, straight behind; seen in profile, slightly inclined forward at the top, and convex behind from the half-way line to the apex, which is much narrower than at the base; it is as high as the first segment of gaster. It thus approximates to the form of the scale in the ♂, and is quite unlike the extremely thin scale of Mayr's ♀. Gaster similar to that of the ♂, and more pointed than in Mayr's ♀.

Mandibles smooth and shining, with scattered punctures. Upper surface of head closely and very finely punctured, the punctures cover the frontal carinae, but do not extend to the sides of the head, nor to the space between the frontal carinae and eyes; clypeus opaque but not sculptured; under surface of head smooth and shining. Back of thorax much more shining than the head, and with fine punctures, which are much less numerous than on the head; sides of thorax and declivity of epinotum mostly smooth; scale smooth, gaster shining and with exceedingly fine puncturation.

Antennae and legs with a fine yellow pubescence; head, and particularly the gaster, with a longer yellow pubescence. Antennae without erect hairs; tibiae with

erect hairs only on the under surface. The whole body furnished with long hairs, dark on thorax, yellow and particularly long and abundant on the scale and gaster.

The ♀, doubtfully attributed to this species by Mayr, is considerably larger, measuring 10 mm. in length, and black in colour, whereas the above-described insect is similarly coloured to the ♂, which it resembles otherwise very closely. It was taken with the whole nest of ♂s under a stone (Nest E) on Aug. 1st, 1914, Picton Junction, nr. Perth, W. Australia. It is noteworthy that a single specimen, without ♀s, of Mayr's ♀, was taken in the Perth district by H. M. Giles in 1914, about the same time, and 1 ♀ with 5 ♂s (Mayr) also without ♂s, on Aug. 3rd, 1914.

The ♂ taken in a different nest of *E. lutea*, and which I hope to describe later, is also entirely different in size and form from the ♂ described by Mayr as belonging to this species.

(2) *Rhytidoponera (sensu stricto) foreli*, sp. nov. ♀. ✓✓

L. 5.7 mm.

Dark brown, almost black; mandibles, scapes, legs and apex of gaster reddish brown.

Head much longer than broad, with feebly convex sides, widest at cheeks, narrowest at occiput, which is deeply emarginate and produced into acute angles.

Mandibles large, broad, and minutely denticulate, the denticles increasing in size towards the apex. Clypeus convex, with the anterior border obtusely angulate; frontal area deeply impressed. Frontal carinae converging behind, with a small angle in the middle at each side; they extend half way to the occiput. The antennal scapes extend for nearly half their length beyond the occiput; the second joint of funiculus somewhat longer than the first, and more than twice as long as broad; all the joints are longer than broad, the last twice as long as the penultimate. Eyes situated immediately behind the middle of the sides of the head, medium-sized, and very prominent.

Thorax hardly, if at all, wider in front than behind; pro-mesonotum only slightly convex; there is a slight emargination between the meso- and epinotum. Pro-mesonotal suture distinct and angular. Teeth at the inferior angles of pronotum small. Base of epinotum nearly flat, passing by a very obtuse angle to the declivity, which is shorter than the base, and hollowed to receive the petiole. The node of the latter viewed from above, broader than long, with convex sides; viewed from the side, slightly higher than the angle of the epinotum, rounded and somewhat narrower at top, and underneath in front armed with an acute, almost vertical, spine. First segment of gaster rounded in front, where it is narrower than behind, shorter than the second segment. The ventral lamella of first gastric segment is produced into a blunt projection beneath the petiole.

Mandibles finely and densely striated longitudinally. Clypeus coarsely reticulate-punctate, the bottom of the punctures perfectly smooth and shining, without any trace of reticulation; on the occiput the punctures have a tendency to merge into each other. The whole of the back of thorax sculptured like the vertex, with the exception of the front of the pronotum, which has a few irregular transverse lines. The sculpture on the sides of the thorax becomes finely reticulate in patches. Scapes and anterior tibiae finely striate longitudinally, the anterior coxae circularly striate. Node of petiole coarsely rugose transversely, but the sculpture is less coarse than that on the thorax.

First segment of gaster finely striate transversely, the striae on the base of the segment semicircular, curving round the sides until they reach the anterior margin; second segment very superficially striate, the lines assuming more of a horse-shoe form than those on the first segment. The remaining segments faintly reticulate.

The whole body covered with short erect hairs; scapes and tibiae with short erect hairs; apical section of gaster fringed with longer hairs. The effect of the polished sculpture is to give the whole insect a shining appearance under a lens.

Koolpinyah, Northern Territory, 1915 (G. F. Hill). No. 589.

(3) *Rhytidoponera* (*Chalcoponera*) *numeensis*, Ern-André, subsp. *borealis*, subsp. nov. ♀

This ant agrees very well with André's description of *R. (C.) numeensis* from New Caledonia, but differs in being smaller (4.0 mm. as against 5—5.5 mm.), and in the following characters:—

Clypeus hardly, if at all, produced between the mandibles, its longitudinal rugae irregular, with faint reticulation between, this reticulation covering all the space between the coarse pits and rugae of the head, thorax and node.

On the first segment of gaster the semicircular striae are almost lost in the dense and fine reticulation that covers this segment, which has in addition the fossae, some of them elongate, of *numeensis*. The second segment, as in *numeensis*, finely and semicircularly striate with scattered shallow fossae.

The head is longer than wide, and widely emarginate behind; the antennae extend a fifth of their length beyond the occipital border.

Thorax widest in front, the inferior angles of pronotum with short teeth. Back of thorax regularly arched, descending to the declivity of the epinotum by a very obtuse angle.

Node of petiole, viewed from above, wider than long, convex in front and nearly straight behind; viewed from the side, both edges are straight; underneath the petiole is a flat process with a tooth at each angle. Pilosity and colour as in *numeensis*.

Stapleton, Northern Territory (G. F. Hill). No. 641.

(4) *Rhytidoponera* (*sens. str.*) *reticulatum*, Forel.

This species is very characteristic owing to the shape of the node. Workers were taken by G. F. Hill in the act of carrying off winged termites after a shower of rain.

Darwin, Northern Territory, Oct. 16th, 1915. No. 672.

(5) *Rhytidoponera* (*Chalcoponera*) *metallica*, Sm. ♀.

Aug. 10th, 1914. Adelaide, Mt. Lofty Range. These ♂s taken from Nest L. by Prof. Poulton, might be considered as a variety of the typical *metallica*. They are a uniform dark metallic green, and the coarse long striae on the front do not continue so far as in the typical form. The scale also is straight, not concave behind, and the first segment of gaster has shallow punctures amongst the fine striation, and the second segment is similar, but the punctures are fewer and shallower. The anterior border of clypeus approaches more to a pointed form than in the typical *metallica*, and the head is not quite so emarginate behind.

(6) *Rhytidoponera* (*C.*) *victoriae*, Ern-André.

Six ♀s and two ♂s were taken by Prof. Poulton under a log (Nest M.), Aug. 15th, 1914, Victoria, in Healesville.

The ♂ of this species, which is not described, I hope to describe later.

(7) *Rhytidoponera* (*Chalcoponera*) *metallica*, Sm. var. *crisulata*, Forel. ♂. (Hitherto undescribed).

L. 7.5 mm.

Black; tarsi dark ferruginous, wings pale brown, nervures dark brown.

Mandibles triangular, dentate. Clypeus swollen behind, the anterior border convex, with an impression running parallel with, and close to, the border. Antennal carinae short and divergent.

Antennae long, the scape much shorter than the second joint of funiculus, all the joints of which, except the second, are much longer than broad.

Head longer than broad, widest behind the eyes, the occipital border feebly concave.

Thorax; Mayrian furrows deeply impressed; the declivity of epinotum longer than the base, with a faint raised border surrounding it; a slight angle separates the two surfaces.

Petiole, from above, is longer than wide; in profile, it is surmounted behind with a rounded node, and beneath anteriorly bears a pointed process.

Gaster elongate, with a distinct constriction between the first and second segments.

Mandibles densely and finely striate, with a few elongate punctures. Clypeus longitudinally rugose, with a fundamental fine reticulation. Mesonotum coarsely reticulate between the Mayrian furrows; this reticulation extends beyond the furrows and merges into a fine longitudinal striation.

Scutellum longitudinally rugose-striate; base of epinotum coarsely rugose transversely, the declivity more finely so. Node transversely rugose.

First segment of gaster finely striate transversely on the anterior portion, the centre of the base (in one specimen) having longitudinal striae (absent in the other specimen); the remaining segments microscopically striate transversely.

The whole body with plentiful long reddish erect hairs, the tibiae with erect hairs. Anterior legs and gaster with a fine grey pubescence.

Two specimens (Nest R.) taken in nest with ♀s, Aug. 23rd, 1914, Blue Mountains, N.S.W., near Mt. Victoria, by Prof. Poulton.

(8) *Rhytidoponera* (C.), sp. nov. (To be described later.) ♀.

July 31st, 1914, near Perth, W. Australia (E. B. Poulton).

(9) *Rhytidoponera* (C.), sp. nov. (To be described later.) ♀ ♂.

August 23rd, 1914, Blue Mts., N.S.W. (Nest R.) (E.B.P.)

#### Sub-fam.: MYRMICINÆ.

(10) *Meranoplus minor*, sp. nov. ♀

L. 2.7-2.8mm.

Castaneous; gaster palest, clubs of antennæ, vertex and nodes, darkest. Terminal border of mandibles edged with dark brown.

Mandibles quadridentate. Frontal area triangular, in some specimens very indistinct. Clypeus bidentate, not deeply emarginate between the teeth.

Head square, upper surface regularly convex, sides parallel, occiput hardly concave; scapes swollen towards the apex; posterior halves of frontal carinae parallel, anterior halves curving inwards and forming a blunt projection on each side of the clypeus; the scrobes extend about an eye's width beyond the eyes.

Pro-mesonotum wider than long, terminated in front by two flat triangular teeth, each lateral border has a broad shallow excision in front, and two deep circular ones behind, the posterior angles terminating in two long blunt teeth which curve inwards; the sides are in addition furnished with flat transparent plates, subparallel, which cover the excisions. The posterior border of mesonotum, which is broadly concave, has a wide and shallow excision in the centre, which is also covered with a membranous plate. Epinotum vertical, with two straight spines in the middle of the sides, the spines are directed outwards, and are shorter than the interval between their bases.

The first node of the pedicel wedge-shaped, its superior border horizontal; second node, seen from above, feebly convex in front, and strongly so, almost angular behind; in profile regularly convex from below to the apex, and concave behind, forming a slight overhanging lip.

Gaster broad and pointed, emarginate at base.

Mandibles striate; clypeus superficially coriaceous, with two or three broken longitudinal ridges. The upper surface of head with longitudinal parallel ridges,

somewhat wide apart; below the eyes are similar ridges, but behind the eyes and between them and the base of the mandibles the ridges are broken up by cross bars. The pro-mesonotum has similar sculpture to the head, but the ridges are less regular, more vermicular, broken here and there by cross bars. Both nodes have a few broken ridges on their upper surfaces, and a few longitudinal ones on their posterior surfaces. In addition, the entire body, including the scapes and legs, is covered with an extremely delicate fundamental reticulation, which is most distinct on the head and gaster (which latter has no other sculpture), and faintest inside the scrobes and beneath the projecting plates of the thorax, and on the epinotum.

There are a few long stiff hairs on the front of the clypeus, and the whole body, including the legs and antennæ, is furnished with short, stiff, erect hairs, which on the antennæ, legs, and under surface of the gaster are pale testaceous, and on the rest of the body, brown. Pubescence nil.

Koolpinyah, Northern Territory, April 6th, 1915. (G. F. Hill, no. 603.) Nest in small hole on a gravel ridge.

Sub-fam.: DOLICHODERINÆ.

(11) *Iridomyrmex emeryi*, sp. nov. ♂.

L. 3.5mm.

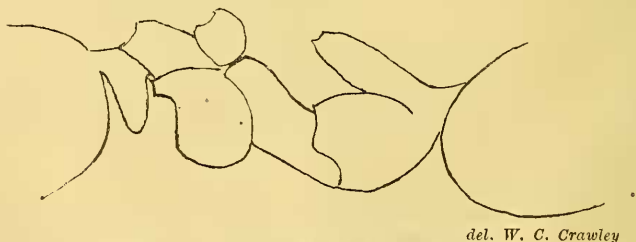
Black; tarsi, basal half of scapes, and mandibles, ferruginous, the tarsi palest. Gaster with a bronze sheen. Some specimens have a faint iridescence on the head.

Mandibles triangular, terminated by a long curved tooth, which is preceded by five or six large and small ones. Clypeus convex in centre, the anterior border widely and shallowly emarginate. Frontal area triangular, fairly distinct, not impressed. Frontal carinæ short and parallel.

Head sub-triangular, longer than broad, widest just behind the eyes, sides convex, occipital border feebly concave, almost straight. Eyes flat, placed in centre of sides. The scapes extend just beyond the occiput.

Pronotum nearly as broad as long; mesonotum narrow, about twice as long as broad, sloping downward to the base, where the stigmata are prominent; there is a deep narrow impression between the mesonotum and epinotum, and the base of the latter rises high above, rounded in profile, the declivity, which is concave at the base, descending sharply; seen from above, the base is longer than wide, and narrower at apex; scale high, but lower than epinotum, somewhat thick, feebly convex in front, straight behind; seen from above, is more than twice as broad as long. Gaster a rounded oval, not overhanging the scale.

The whole insect somewhat shining; mandibles punctured, head, thorax and gaster microscopically reticulate.



del. W. C. Crawley

THORAX OF IRIDOMYRMEX EMERYI ♂ SP. NOV.

A grey pubescence is fairly abundant on the sides of head, thorax and gaster; mandibles with abundant hairs, a few long ones on occiput, pronotum, epinotum, and borders of apical gastric segments.

♀. L. 8.8-5mm.

Colour as in ♂, but no trace of metallic sheen; the antennæ, however, are almost entirely ferruginous, and the legs more so than in the ♂, and the borders of the segments of gaster are edged with a thin but distinct greyish-white margin.

Mandibles and clypeus as in ♂, but the whole head is broader behind and much more narrowed in front, and there is an impressed line from the frontal area to the anterior ocellus; the occiput border is almost straight. The eyes also are more prominent than in the ♂.

The thorax is distinctly impressed between the scutum and scutellum of mesothorax; there is hardly any angle between the two surfaces of the epinotum, which, seen in profile, shows the upper  $\frac{2}{3}$  evenly rounded, and the lower quarter concave; seen from above the segment is broader than long, and is somewhat broader in front than behind. There is a distinct central longitudinal impression near the upper border of epinotum. The scale is much broader and flatter than in the ♂, is slightly convex in front, and flat or concave behind; the superior border rises to a feeble angle in the centre.

Gaster elongate-oval, large, nearly as long as the rest of body.

Sculpture and pilosity as in ♂. Pubescence more abundant, particularly on the head, epinotum and gaster, on the latter it is most plentiful on the borders of the segments and beneath, giving the whole segment a silvery sheen. Wings slightly infusate, the upper with two closed cubital cells.

♂. L. 3.3-3 mm.

Black, with a distinct metallic blue sheen; antennæ and legs fusco-ferruginous, tarsi testaceous.

Mandibles narrow, pointed, edentate, almost straight. Clypeus broad, arched, the anterior border entire, feebly convex.

Head depressed, about as broad as long, narrowing behind the eyes, which are large, prominent, and placed slightly in advance of the middle of the sides. Frontal carinae indistinct; scape shorter than the second joint of the funiculus, and all the joints of the latter, except the first, longer than broad.

Scutellum in profile high and rounded, almost overhanging the epinotum; seen from above, it is narrowed and rounded behind. Base of epinotum in profile, rounded, the declivity, which is much shorter, is nearly vertical; epinotum seen from above is longer than broad, slightly narrowing and convex behind; in the centre of the base is a deep and broad impression. Scale small, broader than long, convex in front and straight behind, from both aspects; gaster small and oval.

Mandibles shining, with a few punctures. Sculpture of rest of body similar to, but fainter than, that of the other sexes.

Pilosity similar, except on scutellum and epinotum, but sparser. Pubescence fairly plentiful on the whole body.

Neuration. Upper wing with one closed cubital cell.

Nests M. and N., under stone, Victoria, in Healesville (E.B.P.). Emery considers this species nearest his *I. calvus*, from New Caledonia.

(12) *Iridomyrmex*, sp. A single ♀, Yallingup to Mammoth and Lake Caves, under log or stone in bush, July 31st, 1914 (E.B.P.). This ant does not agree with any of the published descriptions of the genus, but in default of further material it is perhaps better to leave it undescribed at present.

#### Sub-fam.: COMPONOTINAE.

(13) *Camponotus* (*Myrmosaga*), sp. A single ♀ media which

appears to be an undescribed species, but I prefer to wait in the hope of further material before describing it.

(14) *Camponotus (Myrmogonia)*, sp. ♂ minor. In default of soldiers I propose to give a brief description of this ant, which I cannot trace in any published description, though it appears to come close to Forel's *gibbinotus*.

L. 7-8 mm. -

Dark castaneous, pronotum and anterior half of head clearer, antennae and legs clear testaceous. Basal borders of gaster segments testaceous.

Mandibles 5-6 dentate, clypeus carinate; head longer than broad, with parallel sides, narrowing behind the eyes, the occipital border feebly emarginate.

The whole thorax in profile forms a high and regularly curved arch, the base of epinotum sharply compressed. The whole body is superficially and transversely reticulate-striate.

Body with a few stiff erect hairs, none on the scapes, and on the tibiae only on the underside.

Under log or stone in bush, Yallingup, July 31st, 1914 (E.B.P.).

### Anopheles and Malaria.

Malaria is due to the presence of the terrible little parasite discovered by Laveran, a French medical man, some thirty years ago, and called *Laverania malariae*.

In the spread of Malaria the part which the mosquito plays is that of a carrier of the young parasites or spores, which are present in large numbers in the saliva of the mosquito. Thus, when the *Anopheles* bites a human being to feed upon the blood, some of this saliva carrying spores enters a minute capillary through the wound. The spores thus introduced into the circulation immediately attack and penetrate the red corpuscles of the blood, where they develop and multiply. This multiplication of the spores, by simple division or splitting, is termed "Schizogony," and the spores are themselves called "Enhaemospores." The attacked corpuscles are destroyed, setting free spores which attack other corpuscles. Sexual forms of the parasite soon appear in the blood of the infected person and pass into the next mosquito, which bites the sufferer to feed upon the blood. These male and female forms are sausage-shaped when transferred to the alimentary canal of the gnat (*Anopheles*), but in a short time become sphericle. The male form produces spermatozoa, which fuse with and fertilise the female spheres or egg-cells. A series of metamorphoses then ensues in which a worm-like form partly pierces the intestinal wall and is nourished by the gnat's blood. Cysts are formed which finally break up and produce fresh spores, which accumulate in the salivary glands in the body of the affected mosquito, ready to still further spread this fell disease. This second spore production is known as "Sporogony," and the spores produced are termed "Exotospores," to distinguish them from the former series.

Thus the parasite is absolutely dependent upon the mosquito for part of its development, and the moral therefore is "Do away with the *Anopheles* and you do away with the parasite." In order to do this the carrier of the parasite must be located, and this is the task which the Local Government Board want to carry out; to map out with all